

Use of Toxicity Identification And Evaluation Methods In A Larger Context: The Diagnostics Approach

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There is an increasing need to determine the identity of stressors in the environment. For example, in the US, the Total Maximum Daily Loading (TMDL) process requires states to determine if all surface waters meet specific use requirements (e.g., swimmable, fishable etc.). Surface waters not meeting use criteria are listed as impaired and must be remediated. Steps to remediate impaired water bodies include identification of the stressor, assessment of stressor source, and determination of environmentally appropriate loading values. Identification of the stressor is a critical early step in the remediation of a water body; however, the identification, or diagnostic process is not often clearly defined. We have developed an approach to identify stressors including toxic chemicals which includes the use of TIEs and other diagnostic tools. This phased approach to diagnosing stressors has been named Pollutant Identification and Evaluation (PIE). PIEs consider three major stressor groups-- nutrients, toxics and clean sediments. Phase 1 of a PIE evaluates existing data and uses a series of logical steps to determine if the initial impairment assessment is valid. Phase 2 of PIEs strive to determine the presence of a source, stressor and effect. The objective of Phase 3 is to develop a logical relationship between source, stressor and effect. Finally, Phase 4 confirms the diagnosis. We have completed a retrospective analysis of a data set using this approach and are currently conducting a case study in Narragansett Bay to evaluate this approach for its' diagnostic value and to identify and develop potential diagnostic tools.